

CLAIMS

1. A secondary air supply system comprising:  
an air pump including an electric motor  
and a blower;

5 a secondary air path for leading the  
secondary air discharged from said blower to an exhaust  
pipe upstream of a catalyst for purifying the exhaust  
gas;

an on-off valve operated to open/close  
10 said secondary air path; and

a driving means for opening/closing the  
valve element of said on-off valve,

wherein said driving means for  
opening/closing the valve element of said on-off valve  
15 includes a diaphragm unit having a diaphragm adapted to  
be displaced by the pressure difference between a  
diaphragm chamber with the discharge pressure of said  
blower led thereinto and an atmospheric chamber  
communicating with the atmosphere, and a transmission  
20 means for transmitting the displacement of said diaphragm  
to said valve element, and

wherein said diaphragm chamber is arranged  
in the neighborhood of the outlet of said blower, and  
part of the air discharged from said blower flows  
25 directly into said diaphragm chamber.

2. A secondary air supply system according to  
claim 1,

wherein said valve element is arranged in  
the neighborhood of said diaphragm, and the internal path  
30 leading from said outlet of said blower to said on-off  
valve has a small volume, and

wherein a pressure sensor for detecting  
the pressure of said internal path is arranged in said  
internal path, and the operating conditions of said air  
35 pump are detected by said pressure sensor.

3. A secondary air supply system according to  
claim 1,

wherein said transmission means is a single shaft connecting said diaphragm and said valve element and arranged on the same axis as the rotary shaft of said electric motor on the air discharge side of said air pump, and

wherein said on-off valve including said diaphragm unit and said air pump are integrated with each other.

4. A secondary air supply system according to claim 1,

wherein said valve element is arranged in such a manner as to be seated in closing contact with the side of an opening of a valve seat member downstream of the pump.

5. A secondary air supply system according to claim 1, further comprising at least a control relay for supplying said electric motor intermittently with the current from a DC power supply mounted on a vehicle,

wherein said control relay is arranged integrally with said electric motor in the neighborhood of the intake air path for leading the air from the air inlet of said air pump to the air inlet of said blower.

6. A secondary air supply system according to claim 1,

wherein the surface of said valve element of said on-off valve adapted to be in closing contact with said opening is located nearer to the discharge outlet of said blower, and the other surface of said valve element is located on the exhaust side.